

**IN THE SPECIFICATION:**

Please amend the specification as follows.

Please delete the title "Related Applications" and the paragraph directly beneath it, which begins on page 1 line 3 and ends on page 1 line 7.

Please amend the paragraph beginning at page 1, line 9 as follows:

The present invention relates generally to intravascular catheters for performing medical procedures. More particularly, the present invention relates to shaft assemblies for ~~used~~ use in intravascular catheters. Still, more particularly, the present invention relates to catheter shaft assemblies for use in injection catheters.

Please amend the paragraph beginning at page 2, line 19 as follows:

One example of a medical procedure involving the delivery of a therapeutic and/or diagnostic agent to a targeted portion of a patient's body is the treatment of esophageal ~~varicies~~ varices. This is a condition in which blood vessels of the esophagus are enlarged and may potentially burst. For such a procedure, a therapeutic agent is injected into the varix. When treating an esophageal varix, the agent may be a coagulant such as sodium morrhuate. When a coagulant is injected into a varix, it causes it to occlude. An injection catheter may be used to deliver the therapeutic agent in order to minimize the invasive nature of the procedure.

Please amend the paragraph beginning at page 3, line 15 as follows:

Therapeutic and diagnostic agents may be delivered to a portion of the heart as part of a percutaneous myocardial revascularization (PMR) procedure. PMR is a procedure which is aimed at assuring that the heart is properly oxygenated. Assuring that the heart muscle is adequately supplied with oxygen is critical to sustaining the life of a patient. To receive an adequate supply of oxygen, the heart muscle must be well perfused with blood. In a healthy

heart, blood perfusion is accomplished with a system of blood vessels and capillaries. However, it is common for the blood vessels to become occluded (blocked) or stenotic (narrowed). A stenosis may be formed by an ~~atheroma which~~ atheroma, which is typically a harder, calcified substance which forms on the walls of a blood vessel.

Please amend the paragraph beginning at page 4, line 17 as follows:

Coronary by-pass, angioplasty, and atherectomy procedures have all been found effective in treating individual stenotic lesions in relatively large blood vessels. However, the heart muscle is perfused with blood through a network of small vessels and capillaries. In some cases, a large number of stenotic lesions may occur in a large number of locations throughout this network of small blood vessels and capillaries. The ~~torturous~~ tortuous path and small diameter of these blood vessels limit access to the stenotic lesions. The sheer number and small size of these stenotic lesions make techniques such as cardiovascular by-pass surgery, angioplasty, and atherectomy impractical[[]]

Please amend the paragraph beginning at page 5, line 3 as follows:

When techniques which treat individual ~~tesion~~ lesions are not practical, percutaneous myocardial revascularization (PMR) may be used to improve the oxygenation of the myocardial tissue. A PMR procedure generally involves the creation of holes, craters or channels directly into the myocardium of the heart. In a typical PMR procedure, these holes are created using radio frequency energy delivered by a catheter having one or more electrodes near its distal end. After the wound has been created, therapeutic agents are sometimes ejected into the heart chamber from the distal end of a catheter.

Please amend the paragraph beginning at page 5, line 10 as follows:

Positive clinical results have been demonstrated in human patients receiving PMR treatments. These results are believed to be caused in part by blood flowing within a heart

chamber through channels in myocardial tissue formed by PMR. Increased blood flow to the myocardium is also believed to be caused in part by the healing response to wound formation. Specifically, the formation of new blood vessels is believed to occur in response to the newly created wound. This response is sometimes referred to as ~~angiogenesis~~ angiogenesis. After the wound has been created, therapeutic agents which are intended to promote ~~angiogenesis~~ angiogenesis are sometimes ejected into the heart chamber. A limitation of this procedure is that the therapeutic agent may be quickly carried away by the flow of blood through the heart.

Please amend the paragraph beginning at page 6, line 4 as follows:

The present invention relates generally to intravascular catheters for performing medical procedures. More particularly, the present invention relates to shaft assemblies for ~~used~~ use in intravascular catheters. Still, more particularly, the present invention relates to catheter shaft assemblies for use in injection catheters.

Please amend the paragraph beginning at page 7, line 8 as follows:

An injection catheter in accordance with an exemplary embodiment of the present invention includes a first elongate shaft having an inner surface defining a lumen. A second elongate shaft having an outer surface is slidingly disposed within the lumen of the first elongate shaft. In this exemplary embodiment, the second elongate shaft includes a point and an injection orifice proximate ~~it's~~ its distal end. Also in this exemplary embodiment, an interstitial member is disposed between the inner surface of the first elongate shaft and the outer surface of the second elongate.

Please amend the paragraph beginning at page 10, line 16 as follows:

Second elongate shaft 126 has an outer surface 138, distal end 136, and a proximal end 146. In many applications it is desirable to advance distal end 136 of second elongate shaft 126 by a known distance relative to distal end 134 of first elongate shaft 124. In the embodiment of

figure 1, a slider 142 is fixed to second elongate shaft 126 proximate proximal end 146 thereof. In the embodiment of figure 1, a portion of slider 142 is disposed within a cavity 148 defined by a housing 150. In a presently preferred embodiment, housing 150 is fixed to first elongate shaft 124 proximate proximal end 144 thereof. Also in a preferred embodiment, a plurality of indicia 152 are disposed on a face ~~155~~ 154 of housing 150 proximate slider 142.

Please amend the paragraph beginning at page 15, line 19 as follows:

The fluid injected into the target area may include various therapeutic or diagnostic agents adapted to treat the medical condition which the physician is treating. It is to be appreciated that methods in accordance with the present invention may be used in the treatment of a number of medical conditions. For example, methods and devices of performing percutaneous myocardial revascularization (PMR) in accordance with the present invention have been envisioned. For example, a plurality of wounds may be created in hibernating tissue of the heart. These wounds may be created by injecting a fluid into the tissue of the heart. As a result of these wounds, there will be increased blood flow to the myocardium caused in part by the body's healing response to the wound. One healing response of the body is sometimes referred to as ~~angiogenesis~~ angiogenesis. In addition to promoting increased blood flow, it is also believed that PMR improves a patient's condition through denervation. Denervation is the elimination of nerves. The creation of wounds during this procedure results in the elimination of nerve endings which were previously sending pain signals to the brain as a result of hibernating tissue.

Please amend the paragraph beginning at page 16, line 10 as follows:

Suitable wounds may be created by injecting a fluid such as water, saline, or ringers solution into the heart tissue. Wound formation and revascularization of myocardial tissue may be enhanced by injecting a fluid including a therapeutic agent into the tissue of the heart. ~~Examples;~~ Examples of therapeutic agents which may be suitable include growth factors, drugs and caustic agents. The fluid injected into the heart tissue may also include a radiopaque

material. Injecting a radiopaque material into the wound effectively marks the locations which have been treated. This will aid the physician in procedures which are performed percutaneously using fluoroscopic equipment.

Please amend the paragraph beginning at page 16, line 18 as follows:

In the exemplary embodiment of figure 2, catheter 120 may be utilized to inject fluid into heart 22 of patient 20. It is to be appreciated that catheter 120 may ~~by~~ be utilized in the treatment of various medical conditions occurring in various locations in the body. For example, catheter 120 may be used in the treatment of esophageal ~~varicies~~ varices, a condition in which blood vessels of the esophagus are enlarged and may potentially burst. For such a procedure, injection port 160 would be disposed proximate the enlarged varix and an appropriate agent would be injected into the varix. When treating an esophageal varice, the agent may be a coagulant such as sodium morrhuate. When a coagulant is injected into a varix, it causes the occlusion thereof.

Please amend the paragraph beginning at page 20, line 3 as follows:

Second elongate shaft 626 has an outer surface 638, a distal end 636, and a proximal end 646. In many applications it is desirable to advance distal end 636 of second elongate shaft 626 by a known distance relative to distal end 634 of first elongate shaft 624. In the embodiment of figure 8, a plurality of indicia 652 are disposed on outer surface 638 of second elongate shaft 626 proximate a point 658 of second elongate shaft 626. In a preferred embodiment, indicia 652 are comprised of a radiopaque material. Examples of materials which may be suitable in some applications include gold, platinum, tungsten, iron, silver, and thermoplastic material loaded with a radiopaque filler. Examples of radiopaque filler which may be suitable in some applications include barium sulfate, bismuth subcarbonate, bismuth trioxide, bismuth oxychloride, ~~bismuth subcarbonate~~, tungsten, and depleted uranium.

## CATHETER SHAFT ASSEMBLY

### Related Applications

7M  
9/2/05

The present application is related to U.S. Patent Application Serial No. \_\_\_\_\_, filed by the same assignee on even date herewith and entitled "Tortoise Path Injection Device and Method." The present application is also related to U.S. Patent Application Serial No. \_\_\_\_\_, filed by the same assignee on even date herewith and entitled "Controlled Depth Injection Device and Method."

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### Field of the Invention

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10 The present invention relates generally to intravascular catheters for performing medical procedures. More particularly, the present invention relates to shaft assemblies for used in intravascular catheters. Still, more particularly, the present invention relates to catheter shaft assemblies for use in injection catheters.

### Background of the Invention

008080-08050960

15 Intravascular catheters are currently utilized in a wide variety of minimally-invasive or percutaneous medical procedures. Generally, an intravascular catheter enables a physician to remotely perform a medical procedure by inserting the catheter into the vascular system of the patient at an easily accessible location and navigating the tip of the catheter to a desirable target site. By this method, virtually any target site in the patient's vascular system may be remotely accessed.

20 Typically, a percutaneous procedure begins with the step of inserting a distal portion of the catheter into the patient's vasculature at a convenient location. Once the distal portion of the catheter has entered the patient's vascular system the physician may urge the distal tip forward by applying longitudinal forces to the proximal portion of the